

DOCUMENT RESUME

ED 313 466

UD 027 107

TITLE Research Identifies Effective Programs for Students At Risk of School Failure.

INSTITUTION Center for Research on Elementary and Middle Schools, Baltimore, MD.

PUB DATE Dec 87

NOTE 9p.

PUB TYPE Information Analyses (070) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Academic Achievement; Compensatory Education; Cooperative Learning; *Early Intervention; *Educational Improvement; Elementary Education; *High Risk Students; Individualized Instruction; *Instructional Effectiveness; Preschool Education; Program Effectiveness; Program Evaluation; Program Implementation; *Student Problems; Tutorial Programs

IDENTIFIERS Diagnostic Prescriptive Approach; Education Consolidation Improvement Act Chapter 1

ABSTRACT

If schools improved the academic performance of at-risk students beginning in the early years and continuing through the elementary grades, this improvement would have multiple positive effects on student dropout, delinquency, pregnancy, substance abuse, and other behaviors. Early improvement of poor academic performance could greatly alleviate multiple aspects of the overall problem. This report suggests the following three steps to improve the academic performance of at-risk students from the early grades on: (1) identify early grades programs that have been rigorously evaluated and proved effective; (2) implement these programs as faithfully as possible in preschool, kindergarten, and each elementary grade level; and (3) extensively evaluate effective programs in widespread practice. Summarizing four reviews of research, the report identifies and describes specific examples in the following categories: (1) effective preschool programs; (2) effective kindergarten programs; (3) effective elementary school programs; (4) effective in-class elementary programs, including continuous progress, individualized instruction, and cooperative learning programs; and (5) effective pull-out programs for at-risk students, including tutoring, diagnostic-prescriptive, and computer-assisted instruction programs. The reviews' findings indicate that instructional programs are available now for school districts to launch long-term initiatives to improve the academic performance of most at-risk students. The report includes four references. (AF)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED313466

**Research Identifies Effective Program for Students At Risk
of School Failure**

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

- ☐ This document has been reproduced as
received from the person or organization
originating it.
- ☒ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

J.H. Hollifield

CRENS

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

UD 027 107

9/29/89

CREMS

Research Identifies Effective Programs for Students At Risk of School Failure

A multitude of our nation's students are at risk.

Of dropout, of pregnancy, of delinquency, of substance abuse, of unemployment and underemployment, of suicide, of school failure. At risk.

Programs abound in schools to address these students. Dropout prevention programs, sex education programs, delinquency prevention programs, vocational training programs, alternative school programs, counseling programs -- each picks out a piece of the at-risk student problem.

The Center for Research on Elementary and Middle Schools works to address these immediate problems, but also sees clearly that a common thread winds its way through each -- poor academic performance in school, usually from the early years onward.

Given this common thread, a scenario emerges. If schools could improve the academic performance of at-risk students beginning in the early years and

continuing through the elementary grades, this improvement would have multiple positive effects on student dropout, delinquency, pregnancy, substance abuse, and other behaviors. Thus early improvement of poor academic performance could greatly alleviate multiple aspects of the overall problem.

A two-step process could help schools improve the performance of at-risk students from the early grades on. First, identify programs in the early grades that have been rigorously evaluated and proved to be effective for at-risk students -- programs that *improve the academic performance* of at-risk students.

Second, implement these programs as faithfully as possible in preschool, kindergarten, and each elementary grade level, so that at-risk students, at each level of their schooling, receive effective instruction day after day and year after year.

If we want to determine the results of these efforts, of course, we need to add a third

INSIDE ...

Teacher Practices of Parent Involvement

The TIPS Process

step -- extensive evaluation of the effects of the effective programs in widespread practice.

CREMS researchers have taken the first step. CREMS reviews of research have identified programs from preschool through elementary that offer strong evidence of effectiveness in improving the academic performance of at-risk students.

Effective Pre-School Programs

CREMS researcher Nancy Karweit reaches a general conclusion in her examination of preschool effects -- overall, preschool in itself improves the academic performance of at-risk children.

Karweit reviews existing studies of the short- and long-term effects of preschool attendance for at-risk students. She focuses on studies which evaluated programs for four-year-olds and which used an acceptable research design.

Her review concludes that preschool has robust effects on immediate tests of cognitive functioning, and has longer term effects on other variables related to school success -- lower rates of grade repetition, referral to special education, and dropping out of high school. She finds inconsistent effects of preschool attendance on achievement in upper elementary school.

Karweit's research also addresses the question -- are some specific kinds of preschool programs more effective than others for at-risk children? She examines three studies that compare the outcomes of different curricula. Two of the studies found no consistent differences due to participation in programs that differ in curricula.

"CREMS reviews -- have identified programs from preschool through elementary that offer strong evidence of effectiveness in improving the academic performance of at-risk students."

The third study -- the Curriculum Demonstration Program of High/Scope -- compared the longitudinal effects of an academic preschool program, a cognitively oriented program, and a traditional nursery school program, along with a control group. Effects on student achievement and academic progress were found for all three types of programs, and no one program was significantly more effective than the other two.

This study also implied that the academic preschool program showed later links to increased delinquency. But this finding is not supported by other studies, Karweit notes, and the self-report delinquency scales that produced the finding are suspect.

Karweit's conclusion: The research finds that the preschool programs studied, in themselves, are effective for improving the academic performance of children at risk, as well as showing other benefits. But a major caveat accompanies this conclusion.

"The programs implemented in these studies shared some common features," Karweit says. "A small teacher-child ratio, for example, and sizeable funding. We can't say that widespread implementation by schools of preschool programs that don't share these common characteristics will have the same effects. That's the question we now need to answer."

Effective Kindergarten Programs

A previous synthesis of research by Karweit established that full-day kindergarten programs, compared to half-day programs, improved the academic performance of students at risk. (See *CREMS Report*, June, 1987.) Now she has identified specific kindergarten programs that present convincing evidence that they improve the academic achievement of children who are at risk of school failure.

She defines a "program" as a set of procedures intended to be implemented as a total package and capable of being replicated by others, and she identifies six programs that present convincing evidence of effectiveness based on rigorous methodology.

Alphaphonics (Reading) and Astra's Magic Math -- combines systematic, sequenced lessons into a gamelike format, provides abundant practice and repetition of presentation. Friendly visitors from outer space (Astro, in the Alphaphonics reading program, and Astra in the math program) leave a bag of lesson materials daily for the teacher and the children.

Make Every Child Capable of Achieving (MECCA) -- provides daily observation, assessment, and planning for specialized teaching depending on children's needs. Provides

additional activities based on a task analysis of the learning activity a child is having trouble with.

Project TALK -- uses structured activities to foster language growth. Language specialist teaches specific expressive and receptive language lessons to the class twice a week; classroom teacher conducts follow-up lessons twice a week.

Multisensory Approach to Reading and Reading Readiness Program (MARC) -- combines activities which emphasize knowledge through the senses with a systematic instructional delivery and management system. Increases readiness skills especially in letter recognition and auditory perception of beginning sounds.

First Level Mathematics -- a diagnostic-prescriptive program that provides a sequential curriculum and management system. Uses concrete objects and physical operations, does not require children to display fine motor and visual skills.

Early Prevention of School Failure -- creates individual profiles for children by screening for fine and gross motor, auditory, visual, and language skills. Provides additional pull-out instruction based on identified weaknesses; provides guides for direct modality instruction in each area.

Effective Elementary School Programs

Karweit's reviews of preschool and kindergarten research note that the effects on the academic performance of at-risk students wash out in elementary school. To maintain the improved performance and continue to increase learning, ele-

mentary schools must provide instructional programs that are effective for at-risk students.

This can be done in two ways -- through effective pull-out programs, usually funded by Chapter 1, that concentrate on providing compensatory education services outside the classroom to at-risk students only, or through classroom instructional programs that are effective for all students.

The most cost-effective and efficient way, of course, would be through comprehensive classroom instructional programs that work for all students, including those at risk.

Effective In-Class Elementary Programs

Such elementary school classroom programs have been developed. CREMS researchers Robert Slavin and Nancy Madden review the evidence of effectiveness of in-class programs according to the following criteria:

- o Programs had to have well-specified manuals, materials, and training procedures so they could be readily used;

- o The evidence for effectiveness had to include effects on standardized reading and/or math scales in studies of at least a semester's duration;

- o The program had to be compared to matched or randomized control groups, or report year-to-year gains of at least five normal curve equivalents (NCE's); and

- o The program had to show that its evidence of effectiveness applied to students eligible for Chapter 1 services or other at-risk students.

Applying these stringent criteria, Slavin and Madden identify sixteen programs in three categories that show convincing evidence of effectiveness. The three categories are continuous progress programs, individualized instruction programs, and cooperative learning programs.

Effective Continuous Progress Programs

These instructional programs share three common features. One, students proceed through a well-defined hierarchy of skills, are tested at each level for their readiness to move on to the next skill, and receive further instruction on a skill if they are not ready to move on. Two, careful records are kept of each student's progress through the curriculum, with the data used to make grouping, remediation, and other decisions. Three, most instruction is delivered by teachers to groups of students at the same level.

*"The most cost-effective and efficient way ...
would be through comprehensive classroom
instructional programs that work for all students,
including those at risk."*

The following programs all incorporate the above three features in their instruction, and they provide strong evidence of effectiveness based on comparisons using random or matched control groups. Some distinguishing features of each are noted.

Distar -- provides teachers with specific scripts to use in teaching reading and math and trains teachers in specific methods. Uses direct instruction, rapid pace, high frequency of student responses.

Utah System Approach to Individualized Learning (U-SAIL) -- while the teacher instructs skill-level groups, other students work on independent, exploratory activities.

PEGASUS -- a classic continuous progress program. Organizes the reading program

into 17 levels spanning grades K-8.

Exemplary Center for Reading Instruction (ECRI) -- students receive instruction in reading groups, then work on materials at their own rates. Rapid instructional pace, detailed instructions for teachers, frequent assessment of student progress.

Project INSTRUCT -- classic continuous progress. Students grouped according to skill levels; proceed through hierarchy of skills at their own rates.

Goal-Based Educational Management System (GEMS) -- uses placement tests or pretests to place students in appropriate instructional groups; students proceed at their own rates through 200 skill levels covering grades K-12.

Early Childhood Preventative Curriculum (ECPC) -- intended for use with high-risk first graders. An individualized diagnostic-prescriptive program; most instruction given in small, skill-level groups.

Four other continuous progress models are identified by Slavin and Madden in their review. These, however, were evaluated using year-to-year gains on normal curve equivalents -- evidence which is credible, but less convincing than using random or matched control groups. These programs are the **Weslaco Individualized Reading and Language Arts Instruction and Staff Development Process (WILASD)**, **Conceptually Oriented Mathematics Curriculum (COMP)**, **Coordinated Learning Integration -- Middlesex Basics (CLIMB)**, and **Outcomes Driven Developmental Model (ODDM)**.

Effective Programs Offer Convincing Evidence

Any research synthesis that identifies specific projects or programs as effective can expect an immediate reaction. Why these projects and programs? What about Program X, currently being used in classrooms nationwide? What about Program Y, which has been written up in all the education publications?

The fact is, Program X and Program Y may very well be effective programs for students at risk -- but they either haven't been evaluated to prove their effectiveness, or they have been evaluated but the results aren't convincing because the evaluation design was too

weak. In short, no one is saying that Program X and Program Y are *not* effective -- but convincing evaluative evidence is needed before anyone can say that they definitely *are* effective. CREMS researcher Robert Slavin notes in the Slavin/Madden review of in-class programs: "It is ... likely that many programs excluded from this review will prove to be effective or could be modified to be effective."

And even when convincing evidence is available, there's still reason to hedge a little. Slavin cautions: "Even the carefully selected programs emphasized in this review could

prove to be ineffective in later research." The reason: the evaluative data proving the effectiveness of the program could come from just one successful site, although the implementation of the program in other sites wasn't as successful.

The purpose of research synthesis is to sum up where we are now -- what we know at the present time. We know from these CREMS syntheses that instructional programs and practices exist that can show convincing evidence of their ability to improve the academic performance of at-risk students in preschool, kindergarten, and elementary schools.

Effective Individualized Instruction Programs

Three features distinguish individualized instruction programs. One, students work primarily on programmed or other individualized self-instructional materials. Two, teachers work mostly with individuals rather than groups of students. Three, as in continuous progress programs, careful records are kept of student progress through a structured, hierarchical set of learning objectives.

Slavin and Madden note that many continuous progress programs describe themselves as "individualized," but they do not use self-instructional materials. Also, the researchers caution that the three individualized programs which they identify as effective have *not* presented evidence of effectiveness specifically with at-risk students. The three programs are:

Matteson Four Dimensional Reading Program -- students proceed at their own rates through individualized learning packets for 40-60% of the total reading period; some small- and large-group activities carried out during rest of period. Thus not a "pure" individualized model.

Andover's Individualized Reading System (AIRS) -- delivers almost all language arts instruction through programmed self-instructional materials. Teachers, aides, and volunteers give one-to-one assistance as needed.

Systematic Teaching and Measuring Mathematics Program (STAMM) -- fully individualized instructional program using self-instructional materials and one-to-one instruction by teachers and aides.

Effective Cooperative Learning Programs

The shared features of effective cooperative learning programs are that students work together on learning activities in structured teams and receive recognition based on the performance of all team members; teachers instruct students who are at the same level in a hierarchy of skills, students are assessed frequently, and corrective procedures are provided for students who do not meet a pre-set level of mastery.

Slavin and Madden identified two cooperative learning programs that presented convincing evidence of effectiveness for all students, including at-risk students.

Team-Accelerated Instruction (TAI) -- teachers instruct students in skill-level groups on concepts of mathematics; students work in their cooperative teams on self-instructional materials.

Cooperative Integrated Reading and Composition (CIRC) -- uses a combination of mixed-ability, cooperative work groups and skill-based reading groups to teach reading, language arts, and writing in the upper elementary grades. Teachers work with reading groups; students work in their teams on prescribed sets of activities.

Effective Pull-Out Programs for At-Risk Students

Effective pull-out programs, according to many critics, is a contradiction in terms. But the "supplement, not supplant" regulations of Chapter 1 have made pull-out programs the most common method for

using Chapter 1 funds to provide services to at-risk students -- a situation that isn't likely to change until the Chapter 1 regulations change.

But Nancy Madden and Robert Slavin note what others have noted previously -- that "the important issue is not the setting in which compensatory services are provided, but the quality of the programs provided in the setting."

Madden and Slavin find thirteen quality programs when they review the evidence of effectiveness of pull-out programs according to the same rigorous criteria used to identify effective in-class programs. Of these, six are tutoring programs, in which tutors work one-on-one with identified at-risk students; six are diagnostic-prescriptive programs, in which at-risk students are carefully assessed and instruction appropriate to their needs is given by a teacher outside the regular classroom; students; and two are computer-assisted instruction programs, in which students work on computers for at least part of their remedial reading or math time.

Among these three groups, the most powerful effects -- the largest effect sizes -- were found for the tutoring programs.

Effective Tutoring Programs

Training for Turnabout Volunteers (TTV) -- uses volunteer junior high school students who take tutoring as an elective class to tutor low achieving first-through-sixth graders in reading and math. Allows underachievers who meet requirements to be tutors. Provides considerable initial and continuing training to tutors

Making Chapter 1 Make a Difference

"How can we bring about a state of affairs in which school districts are choosing from among proven programs, implementing those programs effectively, and producing measurable benefits for their at-risk students?"

Elementary School Program Director Robert Slavin asks this question and then discusses how Chapter 1 regulations, funding, and practices could be changed to accomplish this on a national scale.

(1) Establish a valid list of effective programs for at-risk students. The CREMS research is a first step in this direction, but much remains to be done.

(2) Provide resources to help districts adopt effective practices. For one example,

establish state or regional Chapter 1 Effectiveness Centers, staffed by personnel trained in the various effective models and in the dissemination and implementation of successful practices.

(3) Fund research and development of new effective models. Several groups of researchers and developers should be funded to follow a rational sequence of development, pilot-testing, small-scale evaluation, large-scale evaluation by developers, and large-scale evaluation by outside independent evaluators.

(4) Establish independent evaluation centers. These centers would oversee and assist in independent evaluations of programs conducted by state and local evaluation agencies and conduct evaluations of their

own. These evaluations would be essential to insure the credibility of program effects.

To fund this sizable, long-term commitment to the creation of effective programs for at-risk students, Slavin notes that Chapter 1 is a \$3.9 billion program; that none of this money is allocated to insure that the programs it funds actually pay off in significant improvement of student achievement; and that one penny on the dollar would mean \$39 million allocated to research and development of effective Chapter 1 programs.

Reference

Slavin, Robert E. "Making Chapter 1 Make a Difference." *Phi Delta Kappan*, October 1987, pp. 110-119.

involving a structured curriculum.

School Volunteer Development Project -- adult volunteers tutor underachieving students in grades one through six using a variety of materials for a half hour a day, four to five days a week. Tutors receive training in tutoring skills and use of multimedia materials.

Success Controlled Optimal Reading Experience (SCORE) -- uses highly programmed materials and structured tutoring session. Uses rapid drill and practice in list of words grouped to teach specific decoding skills. Tutees are tutored for 15 minutes a day until completion of program, usually four-to-six months.

Programmed Tutorial Reading -- provides one-to-one tutoring by paraprofessionals to first graders in bottom quartile in reading. Uses highly structured tutoring process with programmed materials.

Wallach Tutorial Program -- uses paraprofessionals to tutor children low in readiness skills for half-hour per day on phoneme identification skills. Tutoring focuses on having tutees break up the sounds in words.

Prevention of Learning Disabilities -- screens students for deficits in sensory skills related to reading at kindergarten or beginning first-grade level. Resource teacher tutors students one-to-one or in small

groups of two-to-three, three to five times a week.

Diagnostic-Prescriptive Programs

Project Conquest -- provides remedial services to groups of six students. Early in the year, students receive one-to-one tutoring until they acquire word perception skills. Students are carefully assessed by reading clinicians and given individual prescriptions.

Oklahoma City Chapter 1 Program -- assesses student skills and learning styles and gives instruction appropriate to their needs either individually or in small groups. Uses some computer-assisted instruction.

Lincoln, Nebraska Chapter 1 Program -- uses a diagnostic-prescriptive pull-out model with a computer management system that handles diagnostic tests, assigns students to the program, maintains coordination between the regular teacher and the Chapter 1 teacher, monitors student progress, and evaluates student success.

Diagnostic-Prescriptive Arithmetic Program -- uses a math lab approach. Provides individualized and small group activities keyed to problems identified by the Stanford Diagnostic Mathematics Test.

Columbia, MO Chapter 1 Mathematics Program -- emphasizes coordination of instruction between Chapter 1 and regular classroom teachers. These teachers exchange forms indicating objectives that students are working on, and time is set aside for teachers to meet.

Computer-Assisted Instruction

Computer Curriculum Corporation (CCC) Reading and Math Programs -- use a main-frame with terminals linked to a central processing unit by telephone. The computer records student performance levels and progress and provides students with appropriate exercises.

The CCC curriculum itself has been evaluated for effectiveness. In addition, two programs that use the CCC curriculum also present convincing evidence -- the Title I Mathematics Laboratory with Computer Assisted Instruction (math curriculum), and the Merrimack

(Massachusetts) Education Center program (reading).

Basic Literacy through Microcomputers -- uses microcomputers or electric typewriters to supplement teacher instruction by having students practice applying phonics skills by typing words, sentences, and stories.

Taking the Risk Out of At-Risk

Karweit's reviews of preschool research found preschool, in general, to have short-term effects on achievement of at-risk children. Karweit also reviewed kindergarten research and identified specific kindergarten programs that presented strong evidence of their effectiveness. Slavin and Madden identified effective in-class elementary programs; Madden and Slavin identified effective elementary pull-out programs.

The findings of these reviews indicate that the instructional programs are available right now for school districts to launch a long-term program that will improve the academic performance of most at-risk students. Begin with preschool, follow-up with effective kindergarten programs, install effective in-class elementary programs, and, if Chapter 1 funding continues to demand pull-out programs, install pull-out programs that show convincing evidence of effectiveness.

In short, provide students who are at risk of school failure with effective instructional programs at every level from pre-

school through elementary school.

This scenario has the potential to alleviate, for most at-risk students, the initial burden of poor academic performance early in their school careers -- the burden that shows up clearly as a risk factor in later delinquency, dropout, substance abuse, teen pregnancy, continued poor academic performance, unemployment, and other outcomes.

References

- Slavin, Robert E. and Nancy A. Madden. "Effective Classroom Programs for Students At Risk." Center for Research on Elementary and Middle Schools, The Johns Hopkins University, Report No. 19, November 1987, 38 pages, \$3.50.
- Madden, Nancy A. and Robert E. Slavin. "Effective Pull-Out Programs for Students At Risk." Center for Research on Elementary and Middle Schools, The Johns Hopkins University, Report No. 20, November 1987, 24 pages, \$2.20.
- Karweit, Nancy L. "Effective Kindergarten Programs and Practices for Students At Risk." Center for Research on Elementary and Middle Schools, The Johns Hopkins University, Report No. 21, November 1987, 40 pages, \$3.60.
- Karweit, Nancy L. "Effective Preschool Programs for Children At Risk." Center for Research on Elementary and Middle Schools, The Johns Hopkins University, Report No. 22, December 1987, 35 pages, \$4.00.

"... the instructional programs are available right now for school districts to launch a long-term program that will improve the academic performance of most at-risk students."
